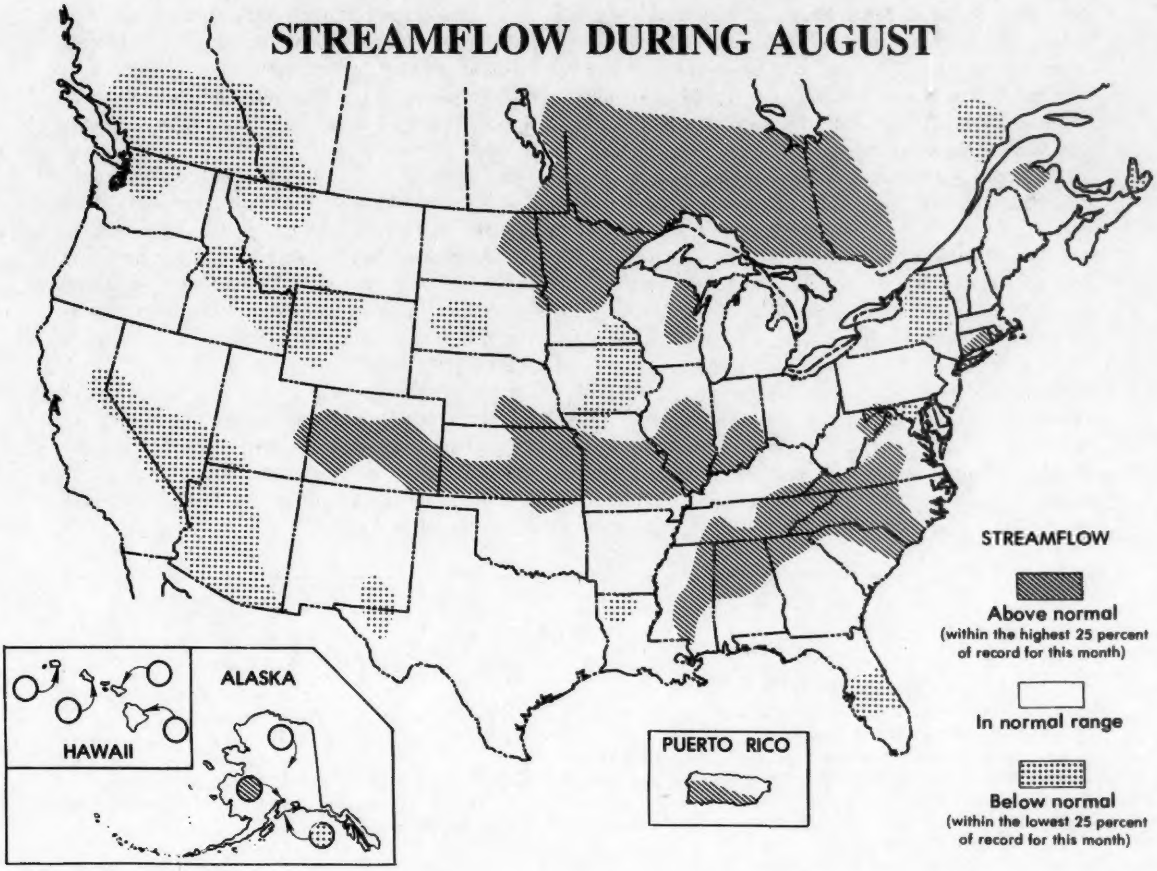
National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

AUGUST 1985

STREAMFLOW DURING AUGUST



Streamflow generally decreased seasonally in the Northeast and much of the West, but increased in the Southeast, some of the western Great Lakes States, Arizona, and also in Nebraska and adjacent States. Streamflow was in the normal range or above that range at 83 percent of the index stations but record-low monthly mean discharges for August occurred at index sites near both coasts.

Severe flooding occurred in the Cheyenne, Wyoming area on August 2, with 9 killed and 30 missing as heavy rains, tornadoes, and hailstorms swept through the area.

Water-use restrictions were still in effect in New York City and parts of the Delaware River basin even though streamflows in the basin were in the normal range for the third consecutive month.

STREAMFLOW CONDITIONS DURING AUGUST 1985

Streamflow generally decreased seasonally in the Northeast, the area from the Rocky Mountains to the Pacific Coast, and also in Alaska, Montana, South Dakota, Minnesota, Iowa, Oklahoma, and Texas. Flows generally increased or were variable in the rest of the United States and southern Canada.

Below-normal streamflow persisted in parts of New York, Florida, Louisiana, Missouri, Iowa, Minnesota, South Dakota, Arizona, California, Nevada, Wyoming, Idaho, Montana, Alberta, British Columbia, and Washington. Monthly mean flows moved into the below-normal range in parts of Alaska, California, Nevada, Arizona, New Mexico, Texas, Iowa, Maryland, New York, Nova Scotia, and Quebec. In New York, both the monthly mean discharge of 387 cubic feet per second (cfs) and the daily mean flow of 309 cfs on August 24 of the Hudson River at Hadley were the lowest for August in 64 years of record. Monthly mean flows were also lowest of record for August in parts of Quebec and on the Columbia River at the Dalles, Oregon (see table on page 3).

Flows remained in the above-normal range in parts of Alaska, Utah, Colorado, North Dakota, Minnesota, Manitoba, Ontario, New Brunswick, West Virginia, Maryland, Tennessee, Alabama, and Missouri. Streamflow increased into the above-normal range in parts of Colorado, Nebraska, Kansas, Oklahoma, Missouri, Illinois, Indiana, Minnesota, Wisconsin, Connecticut, Tennessee, Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, and Puerto Rico. In Kansas, both the monthly mean discharge of 3,510 cfs and the daily mean flow of 19,900 cfs on August 7 were the highest of record for August in 59 years of record (see graph and table on page 3). Monthly mean flows were also highest of record for August in part of Alabama and on the Red River of the North at Grand Forks, North Dakota (see table on page 3).

Tornadoes and hail storms accompanied heavy rains in the area of Cheyenne, Wyoming, on August 2 as severe floods affected the city. Nine persons were killed and 30 were reported missing. Damage estimates were not available.

Contents of about 46 percent of reporting reservoirs declined during August but only about 30 percent recorded below-average contents, most of them located in the Northeast, Texas, Wyoming, Montana, and California. The New York City reservoir system was still well below normal August levels and water-use restrictions were still in effect in New York City and parts of the Delaware River basin.

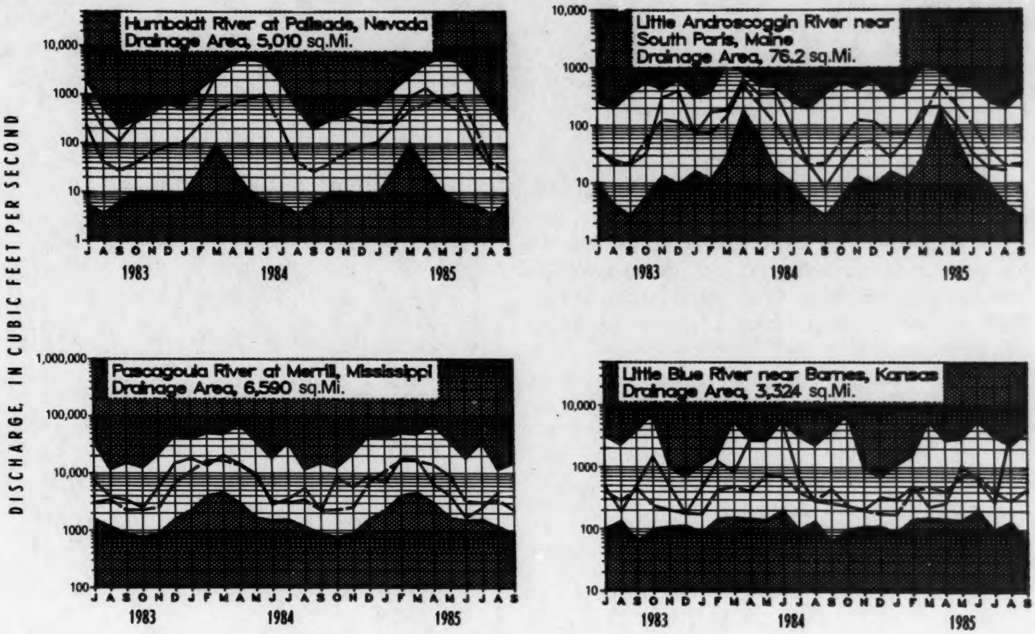
The combined flow of the three largest rivers in the lower 48 States—Mississippi, St. Lawrence, and Columbia Rivers—was 729,668 cfs during August, 15 percent below last month, and 2 percent below the long-term average. These three large river systems account for runoff from more than half the conterminous United States and provide a useful check on the status of the Nation's surface-water resources.

The hydrographs on page 3 show streamflow at four sites scattered across the Nation, with three of the four showing flows currently in the normal range. They are representative of conditions in the Nation since about 84 percent of the index stations have flows at or above the normal range for August.

CONTENTS

SURFACE WATER – MONTHLY MEAN DISCHARGE IN KEY STREAMS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period, 1951–80. Heavy line indicates mean for current period.



Provisional data; subject to revision

NEW EXTREMES DURING AUGUST 1985 AT STREAMFLOW INDEX STATIONS

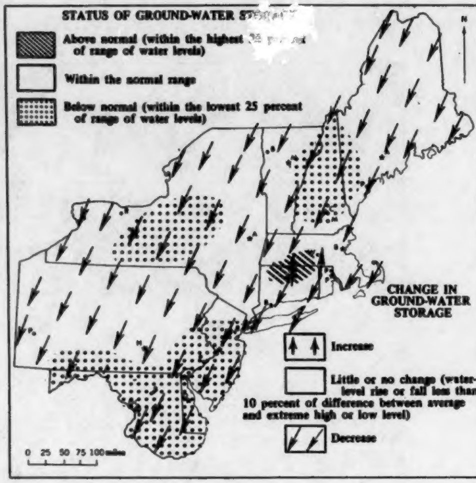
Station number	Stream and place of determination	Drainage area (square miles)	Years of record	Previous August extremes (period of record)		August 1985			
				Monthly mean in cfs (year)	Daily mean in cfs (year)	Monthly mean in cfs	Percent of median	Daily mean in cfs	Day
	LOW FLOWS								
01318500	Hudson River at Hadley, New York.	1,664	64	469 (1941)	339 (1949)	387	37	309	24
01357500	Mohawk River at Cohoes, New York.	3,456	67	909 (1964)	23 (1941)	818	51	453	11
01FB001	Northeast Margaree River at Margaree Valley, Nova Scotia, Canada.	142	66	100 (1937)	64 (1929)	79	33	47	27
14105700	Columbia River at The Dalles, Oregon.	237,000	107	98,560 (1926)	....	93,900	65	70,300	24
	HIGH FLOWS								
03574500	Paint Rock River near Woodville, Alabama.	320	49	551 (1967)	3,240 (1967)	801	1,470	3,520	19
05082500	Red River of the North at Grand Forks, North Dakota.	30,100	103	6,564 (1905)	10,860 (1905)	6,760	590	10,670	22
06884400	Little Blue River near Barnes, Kansas.	3,324	59	2,262 (1977)	8,700 (1977)	3,510	1,232	19,900	7

GROUND-WATER CONDITIONS DURING AUGUST 1985

Ground-water levels continued to decline seasonally in nearly the entire Northeast region (see map). Levels rose in northeastern Connecticut and adjacent Massachusetts, and were above average for end of August in much of the same area. Water levels remained below average in Delaware, Maryland, most of New Jersey, southeastern Pennsylvania, central New York, and also in most of New Hampshire and parts of adjacent States.

In the Southeast, ground–water levels declined in North Carolina and Mississippi; trends were mixed in other southeastern States. Water levels were above average in Kentucky, and below average in Arkansas and Florida. Levels were mixed with respect to average in other southeastern States. A new high ground-water level for August was reached in Kentucky. A new low ground-water level for August was recorded in the key well in Memphis in western Tennessee, and several new August low levels were reported in Lee County in Mississippi.

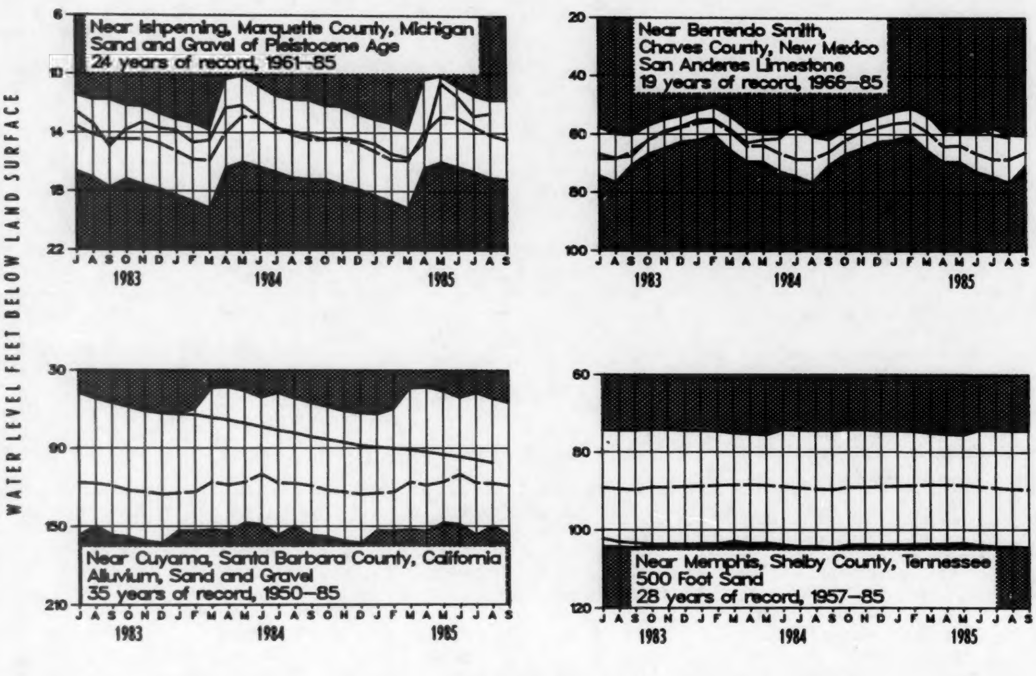
In the central and western Great Lakes States, ground-water level trends were mixed. Water levels were normal or below average in Ohio, and mixed with respect to average in Minnesota, Michigan, and Iowa.



Map shows ground-water storage near end of August and change in ground-water storage from end of July to end of August.

MONTH-END GROUND-WATER LEVELS IN KEY WELLS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates average of monthly levels in previous years. Heavy line indicates level for current period.



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WATER LEVELS IN KEY OBSERVATION WELLS IN SOME REPRESENTATIVE AQUIFERS IN THE CONTERMINOUS UNITED STATES—AUGUST 1985

Aquifer and location	Water level in feet with reference to land-surface datum	Departure from average in feet	Net change in water level in feet since: Last month	Last year	Year records began	Remarks
Glacial drift at Hanska, south-central Minnesota	-6.25	+1.08	0.35	-0.03	1942	
Glacial drift at Roscommon in north-central part of Lower Peninsula, Michigan	-4.61	+0.36	-0.40	-0.06	1935	
Glacial drift at Marion, Iowa	-8.02	-1.86	-3.02	-3.28	1941	
Glacial drift at Princeton in northwestern Illinois	-12.08	-1.03	-1.50	-0.96	1943	
Petersburg Granite, southeastern Piedmont near Fall Zone, Colonial Heights, Virginia	-17.00	-1.18	-0.10	-1.18	1939	
Glacial outwash sand and gravel, Louisville, Kentucky (U.S. well no. 2)	-16.73	+8.41	-0.07	+0.10	1946	
500-foot sand aquifer near Memphis, Tennessee (U.S. well no. 2)	-104.68	-15.20	-0.20	-0.45	1941	August low.
Granite in eastern Piedmont Province, Chapel Hill, North Carolina (U.S. well no. 5)	-42.15	-0.11	-4.45	-5.53	1931	
Sparta Sand in Pine Bluff industrial area, Arkansas	-220.25	-12.99	-5.70	+10.30	1958	
Eutaw Formation in the City of Montgomery, Alabama (U.S. well no. 4)	-22.6	+1.0	-1.7	-3.6	1952	
Limestone aquifer on Cockspur Island, Savannah area, Georgia (U.S. well no. 6)	-34.30	-6.88	+0.80	+0.38	1956	
Sand and gravel in Puget Trough, Tacoma, Washington	-104.28	+7.32	+7.90	+8.40	1952	
Pleistocene glacial outwash gravel, North Pole, northern Idaho (U.S. well no. 3)	-458.8	-0.5	-0.6	-5.5	1929	
Snake River Group: southwestern Snake River Plain aquifer, at Eden, Idaho	-119.4	-3.5	+1.3	+2.1	1957	
Alluvial valley fill in Flowell area, Millard County, Utah (U.S. well no. 9)	-11.65	+29.75	-2.33	-2.66	1929	
Alluvial sand and gravel, Platte River Valley, Ashland, Nebraska (U.S. well no. 6)	-5.70	+0.27	0.90	-2.00	1935	
Alluvial valley fill in Steptoe Valley, Nevada	-9.28	+4.12	-0.38	+0.19	1950	August high.
Pleistocene terrace deposits in Kansas River valley, at Lawrence, northeastern Kansas	-18.40	+2.70	+0.37	+1.55	1953	
Alluvium and Paso Robles clay, sand, and gravel, Santa Maria Valley, California	-110.67	+30.64	-1.49	-13.58	1957	
Valley fill, Elfrida area, Douglas, Arizona (U.S. well no. 15)	-105.9	-25.48	-0.3	+3.1	1951	
Hueco bolson, El Paso area, Texas	-266.51	-17.70	+0.85	-0.90	1965	August low.
Evangeline aquifer, Houston area, Texas	-314.70	-12.21	-5.93	+2.35	1965	

In the West, ground-water levels declined seasonally in North Dakota, southern California, Utah, Arizona, and New Mexico. Trends were mixed in other western States. Water levels were below average in Arizona, and mixed with respect to average in other western States. New high ground-water levels for August were recorded in Nevada and Utah, despite slight net declines during the month in the reporting key wells. New low levels for August occurred in southern California and Nebraska, and a new low August level was recorded in the El Paso key well in Texas despite a net rise of less than a foot during the month. Although there was a net decline of less than a foot during the month in the Steptoe Valley observation well in Nevada, a new alltime low level occurred in 39 years of record. Another alltime low level was reached in 41 years of record in the key well at Dayton, in Eddy County, New Mexico, in the southern part of the Roswell basin.

Provisional data; subject to revision

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF AUGUST 1985

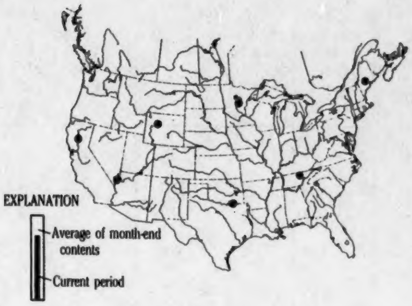
[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

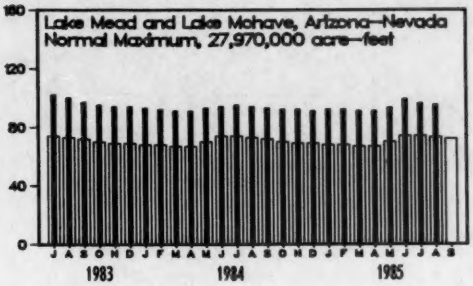
Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	Percent of normal maximum: End of Aug. 1985	End of Aug. 1984	Average for end of Aug.	End of July 1985	Normal maximum (acre-feet)[a]
NOVA SCOTIA					
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs (P)	27	60	49	41	[b]226,300
QUEBEC					
Allard (P)	77	77	69	77	280,600
Gouin (P)	93	93	68	97	6,954,000
MAINE					
Seven reservoir systems (MP)	61	75	68	72	4,098,000
NEW HAMPSHIRE					
First Connecticut Lake (P)	85	85	84	90	76,450
Lake Francis (FPR)	74	68	81	90	99,310
Lake Winnipesaukee (PR)	54	83	75	64	165,700
VERMONT					
Harriman (P)	78	81	70	86	116,200
Somerset (P)	64	68	75	73	57,390
MASSACHUSETTS					
Cobble Mountain and Borden Brook (MP)	55	74	77	56	77,920
NEW YORK					
Great Sacandaga Lake (FPR)	65	76	71	78	786,700
Indian Lake (FMP)	83	86	73	90	103,300
New York City reservoir system (MW)	49	82	83	53	1,680,000
NEW JERSEY					
Wanaque (M)	79	89	75	80	85,100
PENNSYLVANIA					
Allegheny (FPR)	42	49	43	45	1,180,000
Pymatuning (FMR)	92	92	88	95	188,000
Raystown Lake (FR)	67	68	61	68	761,900
Lake Wallenpaupack (PR)	71	63	65	80	157,800
MARYLAND					
Baltimore municipal system (M)	80	100	89	86	261,900
NORTH CAROLINA					
Bridgewater (Lake James) (P)	97	95	88	96	288,800
Narrows (Badin Lake) (P)	99	100	98	86	128,900
High Rock Lake (P)	95	73	74	86	234,800
SOUTH CAROLINA					
Lake Murray (P)	96	88	73	91	1,614,000
Lakes Marion and Moultrie (P)	86	83	69	82	1,862,000
SOUTH CAROLINA––GEORGIA					
Clark Hill (FP)	70	78	67	66	1,730,000
GEORGIA					
Burton (PR)	98	96	87	98	104,000
Sinclair (MPR)	92	95	86	88	214,000
Lake Sidney Lanier (FMPR)	59	64	58	60	1,686,000
ALABAMA					
Lake Martin (P)	93	92	86	99	1,375,000
TENNESSEE VALLEY					
Clinch Projects: Norris and Melton Hill Lakes (FPR)	43	54	46	49	2,229,300
Douglas Lake (FPR)	39	64	47	37	1,394,000
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR)	65	82	69	66	1,012,000
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	51	69	54	56	2,880,000
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	52	76	68	57	1,478,000
WISCONSIN					
Chippewa and Flambeau (PR)	86	79	76	85	365,000
Wisconsin River (21 reservoirs) (PR)	76	62	64	79	399,000
MINNESOTA					
Mississippi River headwater system (FMR)	38	23	34	44	1,640,000
NORTH DAKOTA					
Lake Sakakawea (Garrison) (FIPR)	79	96	94	84	22,700,000
SOUTH DAKOTA					
Angostura (I)	49	73	77	57	127,600
Belle Fourche (I)	...	52	39	33	185,200
Lake Francis Case (FIP)	78	79	73	77	4,834,000
Lake Oahe (FIP)	79	93	...	82	22,530,000
Lake Sharpe (FIP)	99	98	100	100	1,725,000
Lewis and Clarke Lake (FIP)	92	93	96	93	477,000

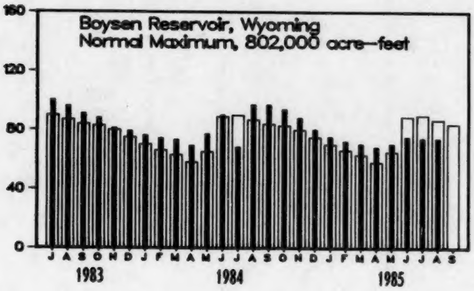
Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	Percent of normal maximum: End of Aug. 1985	End of Aug. 1984	Average for end of Aug.	End of July 1985	Normal maximum (acre-feet)[a]
NEBRASKA					
Lake McConaughy (IP)	71	87	69	75	1,948,000
OKLAHOMA					
Eufaula (FPR)	93	86	81	96	2,378,000
Keystone (FPR)	91	73	89	88	661,000
Tenkiller Ferry (FPR)	105	93	91	105	628,200
Lake Altus (FIMR)	9	19	48	23	133,000
Lake O'The Cherokees (FPR)	94	94	83	94	1,492,000
OKLAHOMA––TEXAS					
Lake Texoma (FMPRW)	88	81	92	94	2,722,000
TEXAS					
Bridgeport (IMW)	75	51	47	83	386,400
Canyon (FMR)	97	83	76	102	385,600
International Amistad (FIMPW)	64	63	81	64	3,497,000
International Falcon (FIMPW)	31	23	65	38	2,668,000
Livingston (IMW)	95	95	86	99	1,788,000
Possum Kingdom (IMPRW)	87	71	98	93	570,200
Red Bluff (PI)	21	29	22	22	307,000
Toledo Bend (P)	86	86	85	91	4,472,000
Twin Buttes (FIM)	9	10	28	10	177,800
Lake Kemp (IMW)	90	69	83	93	268,000
Lake Meredith (FWM)	28	37	40	31	796,900
Lake Travis (FIMPRW)	75	49	75	82	1,144,000
MONTANA					
Canyon Ferry (FIMPR)	78	89	87	80	2,043,000
Fort Peck (FPR)	76	90	89	77	18,910,000
Hungry Horse (FIPR)	83	95	95	94	3,451,000
WASHINGTON					
Ross (PR)	92	99	95	96	1,052,000
Franklin D. Roosevelt Lake (IP)	91	95	104	89	5,022,000
Lake Chelan (PR)	96	98	98	97	676,100
Lake Cushman (PR)	83	99	97	86	359,500
Lake Merwin (P)	102	105	103	104	245,600
IDAHO					
Boise River (4 reservoirs) (FIP)	68	71	58	69	1,235,000
Coeur d'Alene Lake (P)	96	98	76	97	238,500
Pend Oreille Lake (FP)	98	101	100	99	1,561,000
IDAHO––WYOMING					
Upper Snake River (8 reservoirs) (MP)	44	85	58	60	4,401,000
WYOMING					
Boysen (FIP)	74	97	87	74	802,000
Buffalo Bill (IP)	90	94	89	80	421,300
Keyhole (F)	30	43	47	33	193,800
Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey Reservoirs (I)	62	75	51	72	3,056,000
COLORADO					
John Martin (FIR)	84	51	17	91	364,400
Taylor Park (IR)	95	97	78	100	106,200
Colorado–Big Thompson project (I)	76	87	63	85	730,300
COLORADO RIVER STORAGE PROJECT					
Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs (IFPR)	93	99	...	96	31,620,000
UTAH––IDAHO					
Bear Lake (IPR)	83	94	64	88	1,421,000
CALIFORNIA					
Folsom (FIP)	62	68	68	67	1,000,000
Hetch Hetchy (MP)	73	88	70	85	360,400
Isabella (FIR)	41	53	35	51	568,100
Pine Flat (FI)	19	54	44	33	1,001,000
Clair Engle Lake (Lewiston) (P)	79	85	79	83	2,438,000
Lake Almanor (P)	63	95	59	66	1,036,000
Lake Berryessa (FIMW)	78	87	80	80	1,600,000
Millerton Lake (FI)	33	40	44	44	503,200
Shasta Lake (FIPR)	44	76	71	52	4,377,000
CALIFORNIA––NEVADA					
Lake Tahoe (IPR)	66	82	62	76	744,600
NEVADA					
Rye Patch (I)	65	90	67	78	194,300
ARIZONA––NEVADA					
Lake Mead and Lake Mohave (FIMP)	95	94	74	96	27,970,000
ARIZONA					
San Carlos (IP)	76	72	18	84	935,100
Salt and Verde River system (IMPR)	81	74	42	87	2,019,100
NEW MEXICO					
Conchas (FIR)	85	62	84	86	330,100
Elephant Butte and Caballo (FIPR)	87	64	27	90	2,453,000

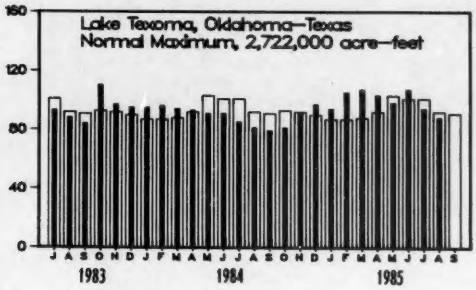
[a]1 acre-foot = 0.0436 million cubic feet = 0.326 million gallons = 0.504 cubic feet per second day.
[b]Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

USABLE CONTENTS OF SELECTED RESERVOIRS AND RESERVOIR SYSTEMS, JULY 1983 TO AUGUST 1985

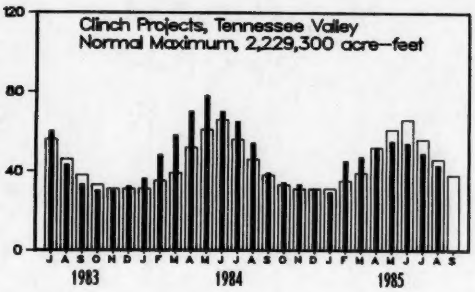


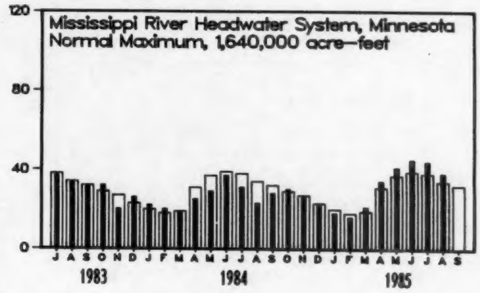


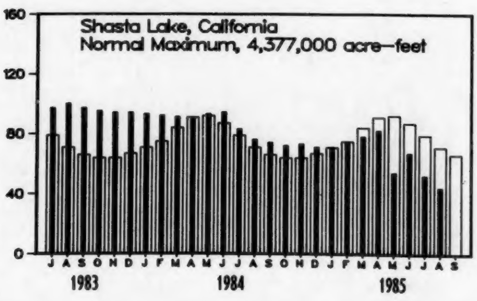


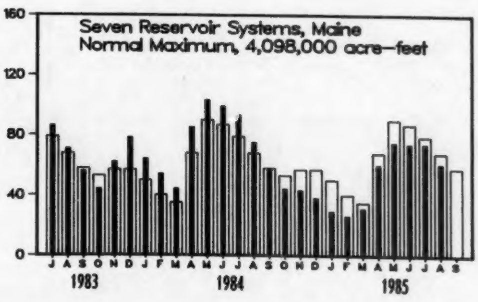


PERCENT OF NORMAL MAXIMUM









FLOW OF LARGE RIVERS DURING AUGUST 1985

Station number	Stream and place of determination	Drainage area (square miles)	Mean annual discharge through September 1980 (cubic feet per second)	August 1985					
				Monthly mean discharge (cubic feet per second)	Percent of median monthly discharge, 1951–80	Change in discharge from previous month (percent)	Discharge near end of month		
							Cubic feet per second	Million gallons per day	Date
01014000	St. John River below Fish River at Fort Kent, Maine	5,690	9,647	3,835	93	-49	1,740	1,124	27
01318500	Hudson River at Hadley, N.Y	1,664	2,909	387	37	-51	450	290	31
01357500	Mohawk River at Cohoes, N.Y	3,456	5,734	818	51	-19	480	310	31
01463500	Delaware River at Trenton, N.J	6,780	11,750	3,525	78	-27	2,700	1,750	31
01570500	Susquehanna River at Harrisburg, Pa	24,100	34,530	6,520	75	-26	4,920	3,179	28
01646502	Potomac River near Washington, D.C.	11,560	[1] 11,490	3,480	100	-19	4,500	2,910	31
02105500	Cape Fear River at William O. Huske Lock near Tarheel, N.C.	4,810	5,005	7,220	287	+188	9,880	6,385	29
02131000	Pee Dee River at Peedee, S.C	8,830	9,851	14,000	260	+274	28,900	18,680	29
02226000	Altamaha River at Doctortown, Ga	13,600	13,880	6,213	105	+88	4,530	2,927	29
02320500	Suwannee River at Branford, Fla	7,880	6,987	4,990	91	+65	6,120	3,955	24
02358000	Apalachicola River at Chattahoochee, Fla	17,200	22,570	13,650	102	+50	14,340	9,268	31
02467000	Tombigbee River at Demopolis lock and dam near Coatopa, Ala	15,400	23,300	11,390	240	+7	30,400	19,650	18
02489500	Pearl River near Bogalusa, La	6,630	9,768	5,018	187	+53	3,220	2,081	31
03049500	Allegheny River at Natrona, Pa	11,410	[1] 19,480	5,379	97	-46	5,830	3,768	27
03085000	Monongahela River at Braddock, Pa.	7,337	[1] 12,510	4,452	105	-62	3,770	2,436	23
03193000	Kanawha River at Kanawha Falls, W. Va	8,367	12,590	5,783	128	+58	4,210	2,720	27
03234500	Scioto River at Higby, Ohio	5,131	4,547	956	78	-59	1,010	652	30
03294500	Ohio River at Louisville, Ky[2]	91,170	116,000	31,760	87	-35	39,060	25,245	25
03377500	Wabash River at Mount Carmel, Ill	28,635	27,220	14,000	154	+45	9,720	6,282	28
03469000	French Broad River below Douglas Dam, Tenn	4,543	6,798	5,424	168	+79	.....	.....	...
04084500	Fox River at Rapide Croche Dam, near Wrightstown, Wis[2]	6,150	4,163	2,955	137	+32	3,716	2,401	28
04264331	St. Lawrence River at Cornwall, Ontario–near Massena, N.Y[3]	299,000	242,700	295,800	112	-2	293,000	189,400	31
02NG001	St. Maurice River at Grand Mere, Quebec	16,300	25,150	14,800	89	-42	20,550	13,280	29
05082500	Red River of the North at Grand Forks, N. Dak	30,100	2,551	6,760	590	+16	8,960	5,791	23
05133500	Rainy River at Manitou Rapids, Minn.	19,400	12,830	18,000	179	-41	22,500	14,540	25
05330000	Minnesota River near Jordan, Minn.	16,200	3,402	1,525	117	-54	2,270	1,467	31
05331000	Mississippi River at St. Paul, Minn	36,800	[1] 10,610	13,420	183	-36	14,200	9,180	31
05365500	Chippewa River at Chippewa Falls, Wis	5,600	5,100	3,986	138	0	4,400	2,840	30
05407000	Wisconsin River at Muscoda, Wis	10,300	8,617	6,270	119	+10	6,516	4,211	30
05446500	Rock River near Joslin, Ill	9,551	5,873	3,290	103	+2	2,690	1,738	31
05474500	Mississippi River at Keokuk, Iowa	119,000	62,620	43,800	109	-21	38,600	24,950	31
06214500	Yellowstone River at Billings, Mont	11,796	7,038	4,514	83	-20	3,160	2,042	27
06934500	Missouri River at Hermann, Mo	524,200	79,490	81,690	146	+14	92,300	59,660	27
07289000	Mississippi River at Vicksburg, Miss[4]	1,140,500	576,600	339,970	101	-14	415,000	268,200	26
07331000	Washita River near Dickson, Okla.	7,202	1,368	359	103	-53	372	240	20
08276500	Rio Grande below Taos Junction Bridge, near Taos, N. Mex	9,730	725	543	189	-57	300	190	31
09315000	Green River at Green River, Utah.	40,600	6,298	3,956	124	-36	2,960	1,913	23
11425500	Sacramento River at Verona, Calif	21,257	18,820	11,150	104	-15	10,000	6,000	31
13269000	Snake River at Weiser, Idaho	69,200	18,050	11,660	105	+19	11,550	7,464	31
13317000	Salmon River at White Bird, Idaho	13,550	11,250	4,200	73	-33	3,070	1,984	31
13342500	Clearwater River at Spalding, Idaho	9,570	15,480	3,350	88	-41	7,110	4,595	31
14105700	Columbia River at The Dalles, Oreg[5]	237,000	193,100	93,900	65	-40	107,100	69,220	28
14191000	Willamette River at Salem, Oreg.	7,280	23,510	3,500	87	-26	6,640	4,291	28
15515500	Tanana River at Nenana, Alaska.	25,600	23,460	59,170	107	-17	52,500	33,930	31
08MF005	Fraser River at Hope, British Columbia	83,800	96,290	97,810	78	-41	72,390	46,790	29

[1] Adjusted.

[2] Records furnished by Corps of Engineers.

[3] Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.

[4] Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.

[5] Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

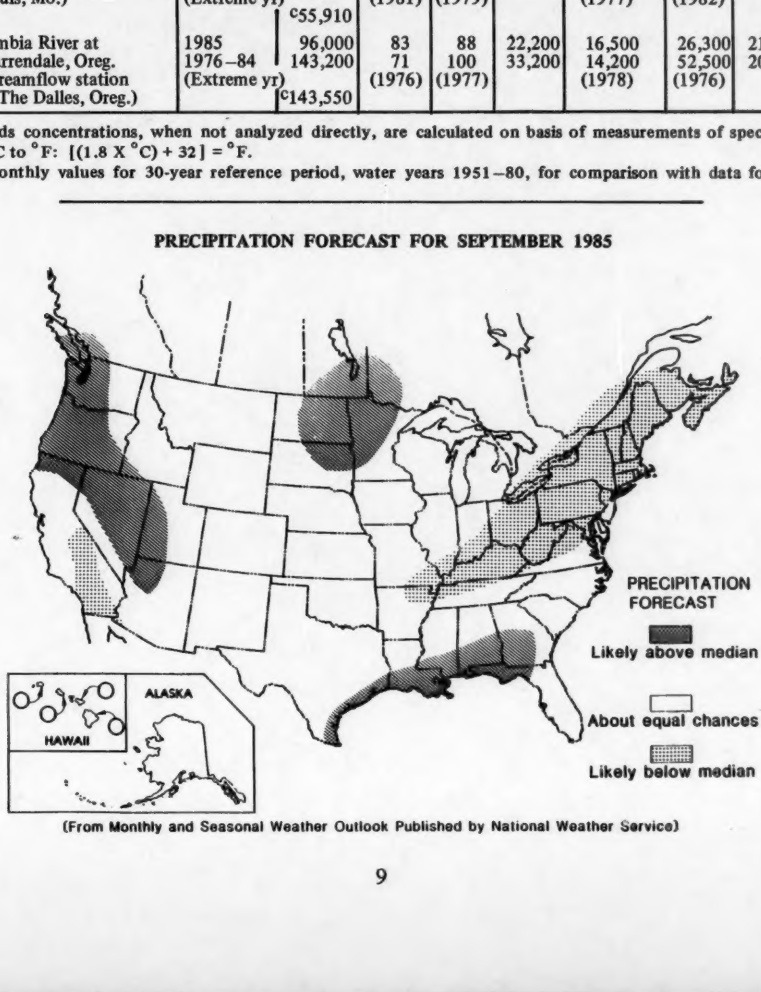
Provisional data; subject to revision

DISSOLVED SOLIDS AND WATER TEMPERATURES, AUGUST 1985, AT DOWNSTREAM SITES ON SIX LARGE RIVERS

Station number	Station name	August data of following calendar years	Stream discharge during month	Dissolved-solids concentration[a]		Dissolved-solids discharge[a]			Water temperature[b]		
			Mean (cfs)	Minimum (mg/L)	Maximum (mg/L)	Mean (tons per day)	Minimum (tons per day)	Maximum (tons per day)	Mean, in °C	Minimum, in °C	Maximum, in °C
01463500	Delaware River at Trenton, N.J.	1985	3,525	104	134	1,138	788	1,810	26.0	23.0	29.5
		1945–84	6,090	67	158	.....	505	21,500	...	17.5	30.0
	(Morrisville, Pa.)	(Extreme yr)		(1945)	(1967)		(1965)	(1955)			
			[c]4,547								
04264331	St. Lawrence River at Cornwall, Ontario, near	1985	295,800	166	166	132,600	129,000	135,000	22.0	21.0	22.5
	Massena, N.Y.	1976–84	285,700	164	170	127,900	113,000	153,000	21.5	19.0	24.0
	(median streamflow at	(Extreme yr)		(1981)	(1978)		(1977)	(1976)			
	Ogdensburg, N.Y.)		[c]263,600								
07289000	Mississippi River at Vicksburg, Miss.	1985	340,000	244	306	235,000	197,000	297,000	28.5	27.0	29.5
		1976–84	396,600	200	299	267,900	118,000	442,000	29.5	26.0	34.0
		(Extreme yr)		(1980)	(1982)		(1977)	(1979)			
			[c]337,900								
03612500	Ohio River at lock and dam 53, near Grand Chain, Ill.	1985	115,000	137	220	.....	27,800	77,400	...	27.0	30.5
	(streamflow station at	1955–84	135,600	121	339	.....	4,490	246,000	...	17.0	30.5
	Metropolis, Ill.)	(Extreme yr)		(1983)	(1977)		(1981)	(1958)			
			[c]121,500								
06934500	Missouri River at Hermann, Mo. (60 miles west of St.	1985	81,700	320	471	85,100	67,700	104,000	25.0	22.0	26.5
	Louis, Mo.)	1976–84	70,490	218	535	77,160	43,000	180,000	27.0	23.5	31.0
		(Extreme yr)		(1981)	(1979)		(1977)	(1982)			
			[c]55,910								
14128910	Columbia River at Warrendale, Oreg.	1985	96,000	83	88	22,200	16,500	26,300	21.0	19.5	22.0
	(streamflow station	1976–84	143,200	71	100	33,200	14,200	52,500	20.5	18.5	22.0
	at The Dalles, Oreg.)	(Extreme yr)		(1976)	(1977)		(1978)	(1976)			
			[c]143,550								

[a]Dissolved-solids concentrations, when not analyzed directly, are calculated on basis of measurements of specific conductance.
[b]To convert °C to °F: [(1.8 X °C) + 32] = °F.
[c]Median of monthly values for 30-year reference period, water years 1951–80, for comparison with data for current month.

PRECIPITATION FORECAST FOR SEPTEMBER 1985



(From Monthly and Seasonal Weather Outlook Published by National Weather Service)

SELECTED PAPERS IN THE HYDROLOGIC SCIENCES 1985

The accompanying preface is from the report *Selected Papers in the Hydrologic Sciences*, edited by Seymour Subitzky, U.S. Geological Survey Water-Supply Paper 2270, 119 pages, 1985. This report may be purchased for $4.50 from Eastern Distribution Branch, Text Products Section, U.S. Geological Survey, 604 S. Pickett St., Alexandria, VA 22304 (check or money order payable to U.S. Geological Survey); or from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 (payable to Superintendent of Documents).

PREFACE

Selected Papers in the Hydrologic Sciences is a new journal-type publication aimed at meeting widespread public and professional interests of the hydrologic community for timely results on hydrologic studies derived from the Federal research program, and the Federal-State cooperative program of the U.S. Geological Survey. Also included will be results of some studies done on behalf of other Federal agencies.

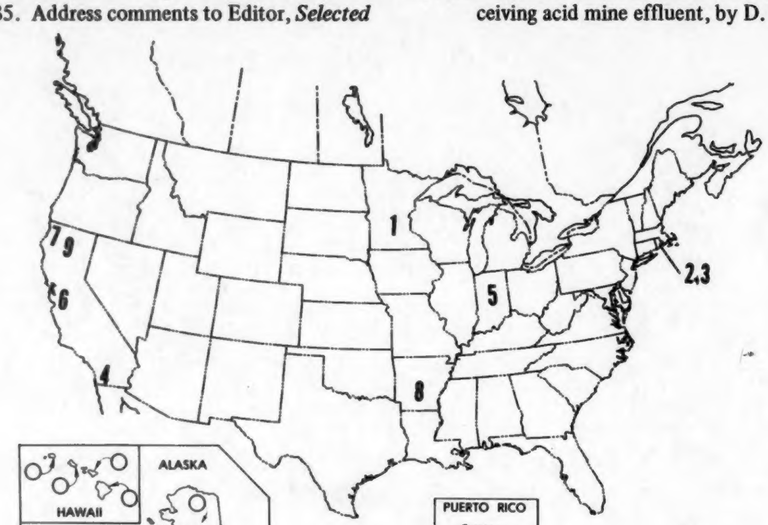
This second volume of the *Selected Papers* series, comprising nine topical papers, addresses an array of topics including model simulation of ground- and surface-water systems, hydrogeochemistry, biochemistry of aquatic environments, and selected physical and chemical techniques on hydrologic studies.

Dialogue between readers and authors is encouraged, and a discussion section for reader's comments and author's replies will be included. Such dialogue, which will relate to papers published in the first volume (July 1984) and this volume, will be open for discussion until September 1985. Address comments to Editor, *Selected Papers in the Hydrologic Sciences*, U.S. Geological Survey, 423 National Center, Reston, Virginia 22092.

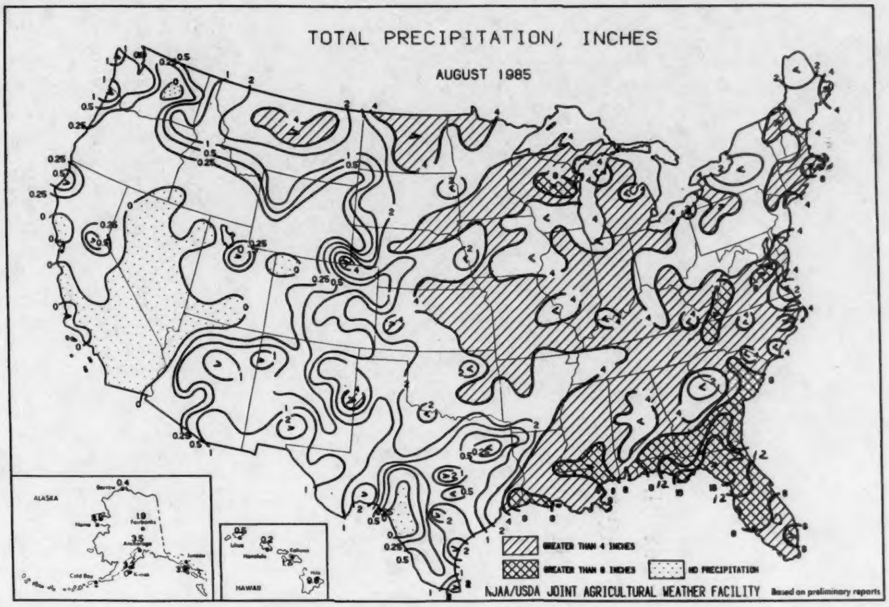
Seymour Subitzky, Editor

The map shows the study area for each paper and is keyed to the list of papers given below.

1. Preliminary modeling of an aquifer thermal-energy storage system, by R. T. Miller.
2. Low-level radioactive ground-water contamination from a cold scrap recovery operation, Wood River Junction, R. I., by B. J. Ryan and K. L. Kipp, Jr.
3. An electromagnetic method for delineating ground-water contamination, Wood River Junction, R. I., by P. M. Barlow and B. J. Ryan.
4. Three-dimensional simulation of free-surface aquifers by finite-element method, by T. J. Durbin and Charles Berenbrook.
5. Measurement of reaeration by the modified tracer technique in the Wabash River near Lafayette and Terre Haute, Indiana, by C. G. Crawford.
6. Performance of sodium as a transport tracer-experimental and simulation analysis, by K. E. Bencala.
7. Uptake and regeneration of nitrate by epilithic communities in a nearly pristine lotic environment, by F. J. Triske, V. C. Kennedy, and R. J. Avanzino.
8. Streambed oxygen demand versus benthic oxygen demand, by J. E. Terry and E. E. Morris.
9. The rate of ferrous iron oxidation in a stream receiving acid mine effluent, by D. K. Nordstrom.



Location of study areas for papers contained in Water-Supply Paper 2270.



(From Weekly Weather and Crop Bulletin published by National Weather Service and Department of Agriculture.)

NATIONAL WATER CONDITIONS

August 1985

Based on reports from the Canadian and U.S. Field offices; completed September 9, 1985

TECHNICAL STAFF	Thomas G. Ross, Editor Carroll W. Saboe Allen Sinnott John C. Kammerer Krishnaveni V. Sarma Sharon A. Edmonds Carole J. Marlow
COPY PREPARATION	Lois C. Fleshmon Sharon L. Peterson
GRAPHICS	Frances B. Davison Carolyn L. Moss

The National Water Conditions is published monthly. Subscriptions are free on application to the National Water Conditions, U.S. Geological Survey, MS 419, Reston, Virginia 22092.

EXPLANATION OF DATA

Cover map shows generalized pattern of streamflow for the month based on 18 index stream-gaging stations in Canada and 164 index stations in the United States. Alaska and Hawaii inset maps show streamflow only at the index gaging stations that are located near the points shown by the arrows.

Streamflow for the current month is compared with flow for the same month in the 30-year reference period, 1951–80. Streamflow is considered to be *below the normal range* if it is within the range of the low flows that have occurred 25 percent of the time (below the lower quartile) during the reference period. Flow is considered to be *above the normal range* if it is within the range of the high flows that have occurred 25 percent of the time (above the upper quartile). Shorter reference periods are used for the Puerto Rico index stations because of the limited records available.

Flow higher than the lower quartile but lower than the upper quartile is described as being *within the normal range*. In the National Water Conditions, the median is obtained by ranking the 30 flows for each month of the reference period in their order of magnitude; the highest flow is number 1, the lowest flow is number 30, and the average of the 15th and 16th highest flows is the median. One-half of the time you would expect the flows for the month to be below the median and one-half of the time to be above the median.

Flood frequency analyses define the relation of flood peak magnitude to probability of occurrence or recurrence interval. Probability of occurrence is the chance that a given flood magnitude will be exceeded in any one year. Recurrence interval is the reciprocal of probability of occurrence and is the *average* number of years between occurrences. For example, a flood having a probability of occurrence of 0.01 (1 percent) has a recurrence interval of 100 years. Recurrence intervals imply no regularity of occurrence; a 100-year flood might be exceeded in consecutive years or it might not be exceeded in a 100-year period.

Statements about *ground-water levels* refer to conditions near the end of the month. The water level in each key observation well is compared with average level for the end of the month determined from the entire past record for that well or from a 30-year reference period, 1951–80. *Changes in ground-water levels*, unless described otherwise, are from the end of the previous month to the end of the current month.

Dissolved soilds and temperature data for August are given for six stream-sampling sites that are part of the National Stream Quality Accounting Network (NASQAN). Dissolved solids are minerals dissolved in water and usually consist predominantly of silica and ions of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, and nitrate. Dissolved-solids discharge represents the total daily amount of dissolved minerals carried by the stream. Dissolved-solids *concentrations* are generally higher during periods of low streamflow, but the highest dissolved-solids *discharges* occur during periods of high streamflow because the total quantities of water, and therefore total load of dissolved minerals, are so much greater than at time of low flow.

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